

REMARKS

Claims 1, 2, 15, 17-21, 24, and 26-30 are pending in the application. Claims 17-20 have been withdrawn from consideration as being directed to a non-elected invention. Therefore claims 1, 2, 15, 21, 24, and 26-30 are at issue.

This response is submitted in accordance with 37 C.F.R. §1.116(a) and §1.116(b) in order to present the rejected claims in a better form for allowance or appeal. The response is necessary to eliminate rejections under 35 U.S.C. §103. This response was not presented earlier because the rejections under 35 U.S.C. §103 are a new ground of rejection. The response should be entered because it places the application in better form for allowance or appeal, and the response does not require further searching or present any new issues.

Applicants note that the Office Action acknowledges that some of the certified copies of the priority documents have been received, but the Office Action does not contain a list of the certified copies that were not received. Because the present application is the national phase of a PCT application, applicants assume that the Office Action contains a typographical error. However, applicants request that, in the next communication from the Patent Office, the examiner either informs applicants that all priority documents have been received or provide a list of missing priority documents.

The claimed invention is directed to a hydrogel having a specific floatability. The claimed hydrogel separates into two portions of superabsorbent polymer particles upon addition to a container filled with an aqueous fluid. One portion of the particles is hydrophilic, sinks to the bottom of the container, and hydrogel swelling starts from the bottom in an upward direction. The other particle portion is hydrophobic, remains on the fluid surface, and swells starting from the top in a downward direction. Separation of the two portions of superabsorbent particles *does not rely upon a density difference*. In particular, the hydrogel does not contain a mixture of superabsorbent polymer particles of different density.

Accordingly, the claimed hydrogel comprises standard superabsorbent polymer particles mixed with and coated by the claimed amounts of a hydrophobic compound and multivalent cation, and, in some embodiments, a hydrophilic compound (see

claim 30). A portion of the resulting superabsorbent polymer particles has a sufficient hydrophobic character to float on the surface of an aqueous fluid to start thickening from the surface of the liquid, and the remaining portion of superabsorbent polymer particles has a hydrophilic character and sinks in the aqueous fluid to start thickening from the bottom of the liquid. This is achieved by treating the superabsorbent polymer particles with a hydrophobic compound and a *multivalent* cation (and in some embodiments a hydrophilic compound), as opposed to admixing of different types of polymer particles, for example, admixing polymer particles having a density of less than one with particles having a density of greater than one. See Examples 1-31 wherein a *single* commercial superabsorbent polymer (i.e., Hysorb F) was coated with various additives. No example contains a mixture of different superabsorbent polymers.

Importantly, the superabsorbent polymer particles are coated with a multivalent cation, i.e., a cation having two or more positive charges, such as Al^{3+} , Ca^{2+} , Mg^{2+} , and the other *multivalent* cations disclosed at page 7, lines 13-16 of the specification. Multivalent cations must be distinguished from *monovalent* cations that have one, and only one, positive charge, such as Na^+ , K^+ , and Li^+ , for example.

As stated in the specification at page 5, lines 11-21:

"The amounts of hydrophilic and hydrophobic particles are advantageously chosen such that not only an increased rate of swell but also a partial floating of the superabsorbent particles on the fluid surface at the start of the swelling process is achieved. The additional coating with hydrophobic particles causes a portion of the superabsorbent to remain on the surface of the fluid to be thickened after all the superabsorbent needed has been added to the fluid to be thickened. A further portion of this superabsorbent thus treated slowly sinks into the solution to be thickened, since superabsorbents based on polyacrylates normally have a higher density than the solutions to be thickened. Without treatment, a commercially available superabsorbent would simply just sink into the solution immediately after addition."

The operation of the claimed hydrogel was demonstrated to the examiner in a previously submitted video. The claimed invention also is illustrated in Examples 1-31 at pages 18 and 19 of the specification, and particularly Examples 24-29.

Claims 1, 2, 15, and 26-30 stand rejected under 35 U.S.C. §103 as being obvious over Tsubakimoto et al. U.S. Patent No. 4,286,082 ('082) in view of a Somasundaran publication (Somasundaran). Claim 21 stands rejected as being obvious over the '082 patent in view of Somasundaran and further in view of Lepore et al. U.S. Patent No. 6,592,768 ('768). Claim 24 also stands rejected under 35 U.S.C. §103 as being obvious over the '082 patent in view of Somasundaran and further in view of Karapasha et al. U.S. Patent No. 5,306,487 ('487). Applicants traverse these rejections.

These rejections are based on an assertion that because the '082 patent discloses a hydrogel containing superabsorbent polymer particles coated with a hydrophobic compound and a multivalent cation, and because Somasundaran discloses hydrophobic pyrogenic silica that floats and hydrophilic silica that sinks, a combination of the '082 patent and Somasundaran render the present claims obvious. The '768 patent and the '487 patent are cited as disclosing further claim elements, such as a biocidal material and particle size. The examiner however misinterprets the cited references, and, accordingly, misapplies the cited references against the claims. The examiner also has failed to consider the invention as a whole, and after a misapplication of the cited references, arrives at the claimed hydrogel by an apparent hindsight reconstruction of the claims.

The proper basis to establish and support an obviousness rejection under 35 U.S.C. §103 was set forth in Amendment "D", filed May 26, 2010 at pages 7-9, and is not repeated here for the sake of brevity, but is incorporated herein by reference.

However, it must be remembered that to establish a *prima facie* case of obviousness, each of three requirements *must* be satisfied, the first of which is that the prior art references must teach or suggest *all* the limitations of the claims. In *re Wilson*, 165 USPQ 494, 496 (C.C.P.A. 1970).

In addition, the Court in *KSR* held that a factfinder should be aware of the distortion caused by hindsight bias and must be cautious of arguments reliant upon *ex post* reasoning. *KSR Intern. Co. v. Teleflex Inc.*, 127 S.Ct., 1727, 1742 (U.S. 2007). The examiner may be utilizing the teachings of the specification in an attempt to modify the references to allegedly arrive at the claimed invention. Applicants respectfully note that

MPEP §§2142 and 2143 require that the teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, and not based on applicants' disclosure. *In re Vaeck*, 947 F.2d 4899 (Fed. Cir. 1991). The mere fact that the prior art may be modified in the manner suggested by the examiner does *not* make the modification obvious unless the prior art suggests the desirability of the modification. *In re Gordan*, 733, F.2d at 902, 221 USPQ at 1127. *In re Fritch*, 23 USPQ 2nd 1780, 1783-1784 (Fed. Cir. 1992). It is impermissible to use the claimed invention as an instruction manual or "template" to piece together the teachings of the prior art so that the claimed invention is rendered obvious. *In re Gorman*, 933 Fed. 2nd 982, 987, 18 USPQ 2nd 1885, 1888 (Fed. Cir. 1991). *In re Fritch*, 23 USPQ 2nd 1780 at 1784 (Fed. Cir. 1992).

The Court in *KSR* held that a patent composed of several elements is not proved obvious merely by demonstrating that each element was, independently, known in the prior art (*KSR*, 127 S.Ct. at 1741). The court further emphasized the importance of *identifying a reason* that would have prompted a person of ordinary skill in the relevant field to combine the elements in the way the claimed new invention does, which the examiner has not provided (*Id.*, emphasis added).

The '082 patent is directed to an absorbent resin composition comprising water-absorbent resin particles blended with an ultra microscopic silica of specific surface area and particle diameter.

The examiner *incorrectly* asserts that the '082 patent also discloses that the water-absorbent resin particles are coated with a *multivalent* cation, and refers to column 3, lines 46-47 of the '082 patent. First, this portion of the '082 patent *only* discloses monovalent cations, i.e., lithium, sodium, and potassium. Second, the resin particles are *not* even coated with such monovalent cations. They are the counterion of the base used to neutralize the polacrylic acid. See '082 patent, column 3, lines 20-41, disclosing the neutralization of acrylic acid using an alkali metal hydroxide. The '082 patent fails to disclose a multivalent cation anywhere in the reference.

The examiner has misinterpreted the '082 patent by asserting that the reference discloses a multivalent cation.

The CAFC has held that an assertion of obviousness is called into question when the cited art is misinterpreted. In *In re Chapman* (CAFC 2009-1270, Feb. 2010), the court noted errors made by the USPTO in interpreting a reference, and stated the following:

"The government argues that these errors are harmless, but we conclude that these errors are harmful because they increase the likelihood that Chapman was erroneously denied a patent on grounds of obviousness. If the Board based its decision on a misunderstanding of Gonzalez, its conclusions regarding obviousness are called into question. With respect to the second error, the Board was mistaken as to whether Gonzalez teaches the use of a polymer to link the light and heavy chains in a F(ab')₂ fragment in the cited embodiment. Therefore, Chapman's use of a polymer to link together two F(ab') fragments may be less likely to be obvious. Further, as to the third error, if the Board did not appreciate the full scope of antibody fragments disclosed in Gonzalez, we cannot be confident about its ultimate conclusion that the selection of one of them to form Chapman's molecule is obvious, as it appears that there are more possibilities from which to choose. Because we cannot say with confidence that the Board would have reached the same conclusion in the absence of these errors, we are persuaded they are indeed harmful. See *Kotteakos v. United States*, 328 U.S. 750, 765 (1946)."

In the present application, the examiner has misinterpreted a monovalent cation of the '082 patent as being a multivalent cation.

It also must be noted that the present claims *cannot* be read to encompass the monovalent cations of the '082 patent. The claims are given the broadest *reasonable* interpretation during examination. However, an examiner cannot give the claims an incorrect interpretation. As stated in *In re Skvorecz* (580 F.3d 1262, 1267 (Fed. Cir. 2009)):

"The protocol of giving claims their broadest reasonable interpretation during examination does not include giving claims a legally incorrect interpretation. This protocol is solely an examination expedient, not a rule of claim construction. Its purpose is to facilitate exploring the metes and bounds to which the applicant may be entitled, and thus to aid in sharpening and clarifying the claims during the application stage, when claims are readily changed. See *In re Buszard*, 504 F.3d 1364, 1366 (Fed. Cir. 2007); *In re Cortright*, 165 F.3d 1353, 1358 (Fed. Cir. 1999).

Also see *In Re Ravi Vaidyanathan* (CAFC 2009-1404, May 19, 2010) stating:

"The PTO Solicitor responds that the broadest reasonable claim interpretation that is supported by the specification is adopted during examination, for the claims can readily be amended during examination, to impart precision if needed. We agree with this protocol as an examination expedient, for its purpose is to aid in sharpening the claims in order to avoid ambiguity or uncertainty in the issued patent. See e.g., *In re Skvorecz*, 580 F.3d 1262, 1267 (Fed. Cir. 2009); *In re Buszard*, 504 F.3d 1364, 1366–67 (Fed. Cir. 2007); *In re Prater*, 415 F.2d 1393, 1396 (CCPA 1969). However, the PTO's "broadest" interpretation must be reasonable, and must be in conformity with the invention as described in the specification.

The Board's interpretation of claim 9 finds no support in the '203 specification, and is not a reasonable interpretation under the rules of claim construction. The description in the specification consistently indicates that the neural network guides the munition all the way intercept. The '203 specification uses the word "strike" synonymously with "intercept," foreclosing the divergent meanings the Board seeks to attach to these terms. The Board's rejection of claims 8 and 9 was based on an incorrect interpretation of these claims. That rejection is vacated and remanded for reconsideration under the correct interpretation of the claims, and in further view of the issues with respect to obviousness as discussed in connection with claims 1–7."

Neither the '082 patent nor, as discussed below, Somasundaran teaches or suggests coating superabsorbent polymer particles with a multivalent cation. Accordingly, for this reason alone, the combination of cited references cannot render the present claims obvious.

Somasundaran fails to cure the deficiencies of the '082 patent. In particular, Somasundaran fails to teach or suggest coating superabsorbent polymer particles with a multivalent cation. Somasundaran merely describes fumed silica and its uses. Although fumed silica floats on water, the combination of cited references (fails to teach or suggest that coating superabsorbent polymer particles with fumed silica would improve the floatability of the particle, especially at the low claimed amount (i.e., 0.05% - 1%, by weight) of hydrophobic compound coated on the superabsorbent polymer particles.

The examiner also misinterprets the references at paragraph 9, page 4 of the Office Action. First, alumina cannot be "in the form of aluminum sulfate". Alumina is a specific, water-*insoluble* compound, i.e., Al_2O_3 . Aluminum sulfate is a different specific, water-*soluble* compound, i.e., $\text{Al}_2(\text{SO}_4)_3$. Aluminum sulfate is not hydrophobic, but is a water-soluble salt.

In addition, the '082 patent fails to teach or suggest floatability or thickening, as the examiner asserts, but rather teaches the *opposite*, i.e., that the "particles retained fluidity for a long period of time even after absorption of moisture" ('082 patent, column 15, lines 51-56).

The examiner asserts that the particles of the '082 patent and the claimed particles are substantially identical and therefore should perform similarly. This assertion is incorrect because the '082 patent *fails* to teach or suggest a coating of multivalent cations.

The examiner misinterpreted the '082 patent *again* with respect to claim 2. The '082 patent does *not* disclose a blood absorbance at Table 2 of claim column 15. Table 2 clearly discloses absorption of 0.9% saline in the headings of the table. The '082 patent *fails* to teach or suggest blood absorption, let alone the high blood absorption recited in claim 2.

The examiner's rationale supporting the rejection of claim 28 also is in error. The '082 patent discloses monovalent cations only, not multivalent cations, as discussed above. Somasundaran also fails to teach multivalent *cations*. Somasundaran teaches alumina wherein the aluminum atoms are bound to the oxygen atoms and are *not* available as cations. Alumina is not water soluble.

In summary, for all the reasons set forth above, it is submitted that claims 1, 2, 15, 26-30 would not have been obvious over a combination of the '082 patent and Somasundaran under 35 U.S.C. §103 and that the rejection should be withdrawn.

Claim 21 stands rejected under 35 U.S.C. §103 as being obvious over the '082 patent in view of Somasundaran in further view of Lepore et al. U.S. Patent No. 6,592,768 ('768 patent). Applicants traverse this rejection.

The patentability of claim 21 over a combination of the '082 patent and Somasundaran has been discussed above. The '768 patent fails to cure the deficiencies of the '082 patent and Somasundaran. The '768 patent is relied upon for including a biocidal material with superabsorbent polymer particles. The '768 patent fails to teach or suggest coating superabsorbent polymer particles with a hydrophobic compound and multivalent cations.

Claim 21 recites a preferred embodiment of the present invention. Applicants do not rely solely upon the features recited in claim 21 for patentability, but rather rely upon the features of claim 21 and the feature of independent claim 1 from which claim 1 depends. Accordingly, it is submitted that claim 21 is patentable over a combination of the '082 and '768 patents and Somasundaran for the same reasons that claim 1 is patentable over the '082 patent and Somasundaran, and that the rejection of claim 24 should be withdrawn.

Claim 24 stands rejected under 35 U.S.C. §103 as being obvious over the '082 patent in view of Somasundaran in further view of Karapasha et al. U.S. Patent No. 5,306,487 ('487). Applicants traverse this rejection of claim 24.

First, the examiner's rationale to support the rejection is faulty. The examiner argues that the smaller particles, as recited, would increase fluid uptake. However, the recited particle size is that of the *hydrophobic* compound, which does not absorb aqueous fluids. The examiner has misinterpreted the claim and the art, and such errors were found to be harmful, and as such a conclusion of obviousness based on the misinterpretation can be called into question (*In re Chapman* (CAFC 2009-1270, Feb. 2010)).

The examiner also incorrectly states that particle size provides floatability. In the present application, the particle size of the hydrophobic compound is much smaller than the particle size of the superabsorbent polymer particle, which controls any size related arguments. Further, it is the hydrophobicity of the hydrophobic compound, and the amount of hydrophobic compound, that primarily contributes to the claimed floatability of the claimed particles.

Finally, claim 24 recites a preferred embodiment of the present invention, and applicants do not rely solely upon the features recited in claim 24 for patentability, but rather rely upon the features recited in independent claim 1 and in dependent claim 24 for patentability.

Accordingly, it is submitted that claim 24 is patentable over a combination of the '082 and '487 patents and Somasundaran for the same reasons that claim 1 is patentable over the '082 patent and Somasundaran, and that the rejection of claim 21 should be withdrawn.

Claims 1, 26, and 28 stand rejected on the ground of obviousness-type double patenting over claims 1 and 4-6 of copending application number 10/577,028 ('028 application), which has been allowed.

Applicants respectfully submit that claims 1, 26, and 28 of the present application are patentably distinct over claims 1 and 4-6 of the '028 application. Further, applicants submit that, in determining obviousness-type double patenting, the question to be considered is stated *In re Vogel and Vogel*, 164 U.S.P.Q. 619, 622 (CCPA 1970), i.e., "Does any claim in the application define merely an obvious variation of an invention disclosed and claimed in the patent?". The CCPA goes on to indicate that, "In considering the question, the patent disclosure may not be used as prior art."

The pending claims are directed to a hydrogel comprising superabsorbent polymer particles coated with a hydrophobic compound and a multivalent cation. In comparison, the claims of the '028 application are directed to polymeric particles coated with at least one surfactant, at least one solvent having one hydroxy group and at least one ether group, and aluminum cations.

The present claims fail to teach or suggest a solvent as claimed in the '028 application. The '028 application fails to teach or suggest a hydrophobic compound. The examiner has provided no rationale wherein a person skilled in the art would have any incentive to substitute a solvent of '028 application for the hydrophobic compound of the present application, or vice versa. Further, if the solvent of the '028 application was

substituted for the claimed hydrophobic compound, the resulting particles would not exhibit the claimed floatability/thickening properties as presently claimed because the particles would not have the necessary hydrophobic character to float and partially thicken the top surface of a liquid.

In applying the test set out in *In re Vogel*, applicants submit that present claims 1, 26, and 28, directed to particles coated with a hydrophobic compound, clearly are not made obvious to one of ordinary skill in the art by claims 1 and 4-6 of the '028 application, all directed to particles treated with particular solvent containing a hydroxyl group and at least one ether group.

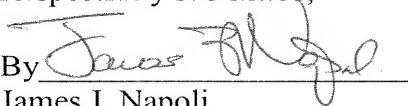
Furthermore, applicants clearly are not attempting to claim related subject matter in order to extend the patent term of claims in the '028 application, which the doctrine of obviousness-type double patenting over claims 1 and 4-6 of the '028 application should be withdrawn. In particular, the present application and the '028 application have the same PCT filing date, and under normal circumstances will expire on the same day.

It is submitted that all pending claims are in a form and condition for allowance. An early and favorable action on the merits is respectfully requested.

Should the examiner wish to discuss the foregoing, or any matter of form in an effort to advance this application toward allowance, the examiner is urged to telephone the undersigned at the indicated number.

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Respectfully submitted,

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